WREN'S NEST PRIMARY SCHOOL

School Key Policy 2020-2021

Multiplication Policy – Teaching Times Tables

September 2021

Document to be read in conjunction with ***other key school policies (listed within document)***

This document has been written in order to ensure consistency across the school with regards to the introduction and teaching of times tables.

It is not intended to be year group specific. Instead, it outlines 7 key steps that teachers should consider when introducing a new times table.

Step 1 Order of introduction

Step 2 Making conceptual links to the real world - display

Step 3 Use of the concrete, pictorial, abstract approach – use of arrays to model

Step 4 Introduce new times table by building it around facts already known

Step 5 Explore patterns in times tables. Reasoning. Investigation. Deeper learning. Making links

Step 6 Consistency of language

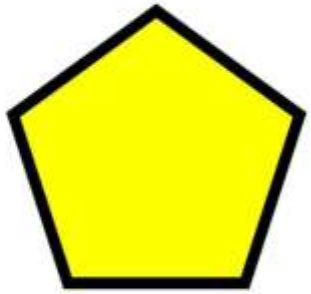
Step 7 Time- tabled opportunities to practise times tables facts

Step 1 - Order of introduction

Year group	What should be taught?	Additional comments
Reception	• Introduce concept of X1 (one group of 5 etc) • Solve problems with doubling and halving	
Year 1	• Counting in multiples of **2, 5 and 10** • **X1 table (one group of…)**	
Year 2	• Count in steps of **2,3 and 5** from 0 and in **10s** from any number forwards or backwards. • **Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables**, including recognising odd and even numbers. • **Begin to introduce concept of square numbers through arrays** • **X1 table** • **Begin to introduce X0 table**	
Year 3	• Count from 0 in multiples of **4, 8, 50 and 100** • Recall and use multiplication and division facts for the **3, 4, 8 and 11** multiplication tables • Revise **X2, X5, X10** multiplication tables • **X1 and X0 tables** • **Square number times tables**	Link x4 to x2. Link x8 to x4.
Year 4	• Count in multiples of **6, 7, 9, 25 and 100** • Recall multiplication and division facts for multiplication tables up to **12 x 12** (**x6, x7, x9 and x12** are new tables for this year group) • Revise **X0, X 1, X 2, X 3, X4, X 5, X 8, X10** • **Continue with square number times tables**	Link x6 to x3. Link x12 to x6
Year 5	• Revise **all times tables (including x0 and x1) to 12x12** • Revise **square number times tables** • Establish whether a number to 100 is prime. • **Recall prime numbers to 19**	
Year 6	• Revise **all times tables (including x0 and x1) to 12 x12** • Revise **square numbers times table** • Revise **prime numbers**	

Step 2- Introduce new times tables by making conceptual links to the real world.

Make a classroom display



Step 3 – Ensure using CPA (concrete, pictorial, abstract) approach when teaching times tables.

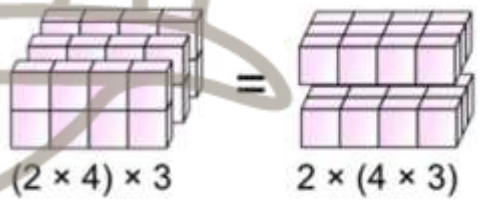
Be clear which representation you will use and why.

Arrays for representing multiplication.

Arrays are the most versatile model for modelling the properties of multiplication (repeated addition, commutative, distributive, associative, inverse of division).

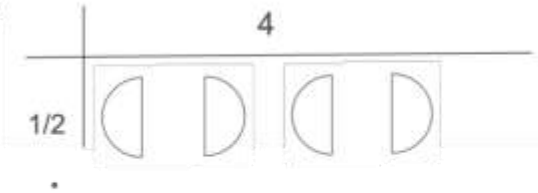
Make use of array sliders!

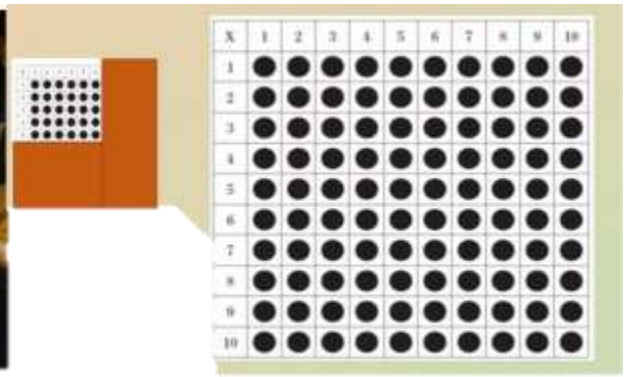
2 x 24 or 24 X 2



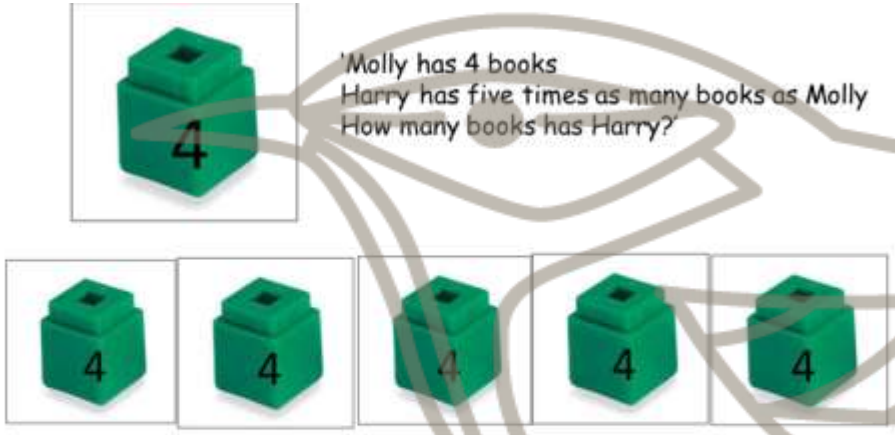
12 x 2 = (4 x 3) x 2 = 24

(10 x 2) + (2 x 2)

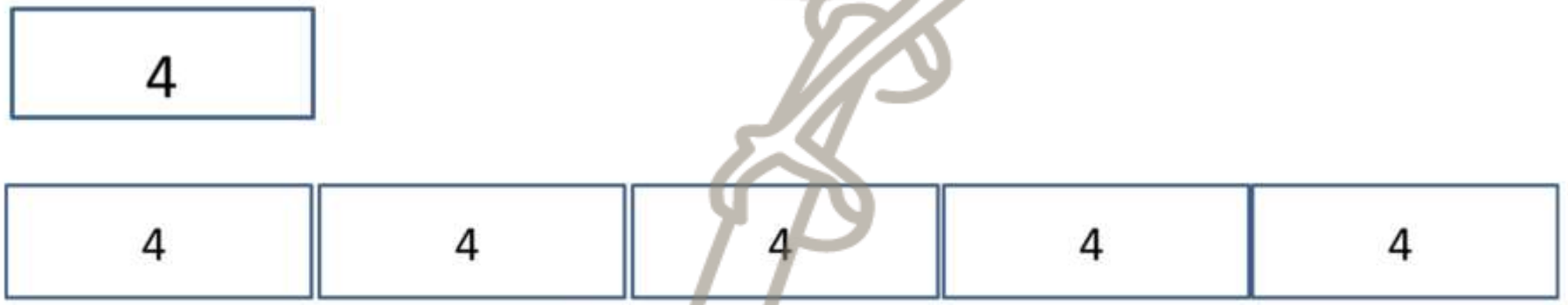




Bar model for representing multiplication problems.



4 x 5 = 20 (books)



4 x 5 = 20 (books)

Step 4 – Introduce a new times table by building it around facts that children already know.

Do this together.

e.g. We have learned the 2,3,4,5 and 10 times tables. We have already me some of the facts from the 8 times table. What are they?

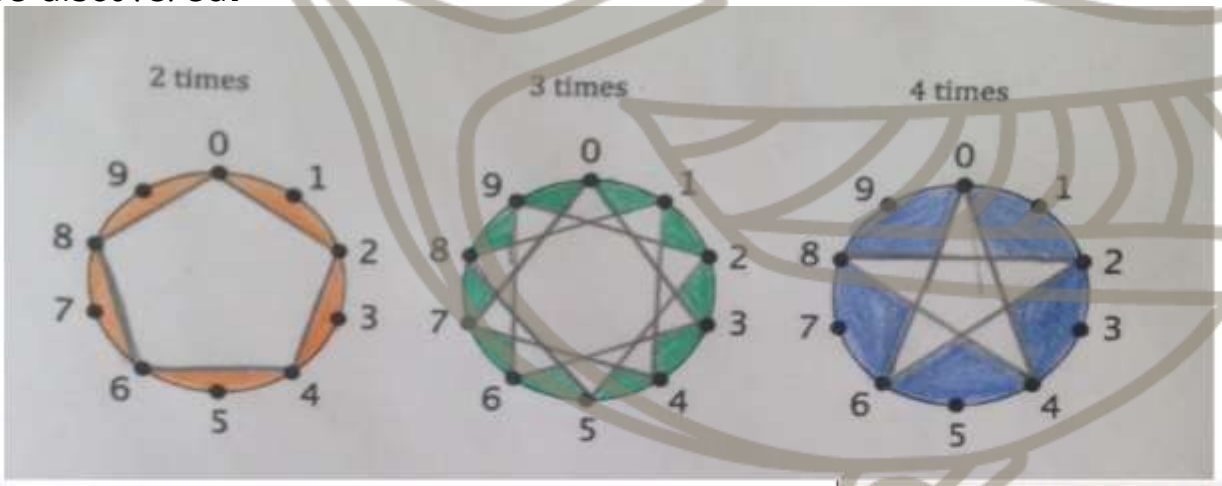
8 x 0 = 0
8 x 1 = 8
8 x 2 = 16
8 x 3 = 24
8 x 4 = 32
8 x 5 = 40
8 x 6 =
8 x 7 =
8 x 8 =
8 x 9 =
8 x 10 = 80
8 x 11 =
8 x 12 =

Which facts are left to learn?

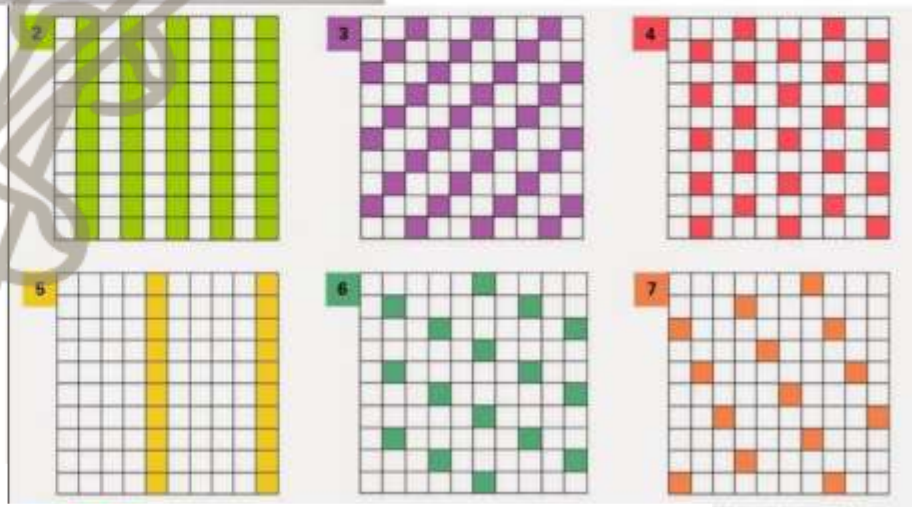
Which facts might help us to work out the facts we don't know?

Step 5- **Take time to explore the patterns of each times table as you introduce it to the class. Provide opportunities which deepen knowledge and understanding and require children to reason, conjecture, predict and explain.**

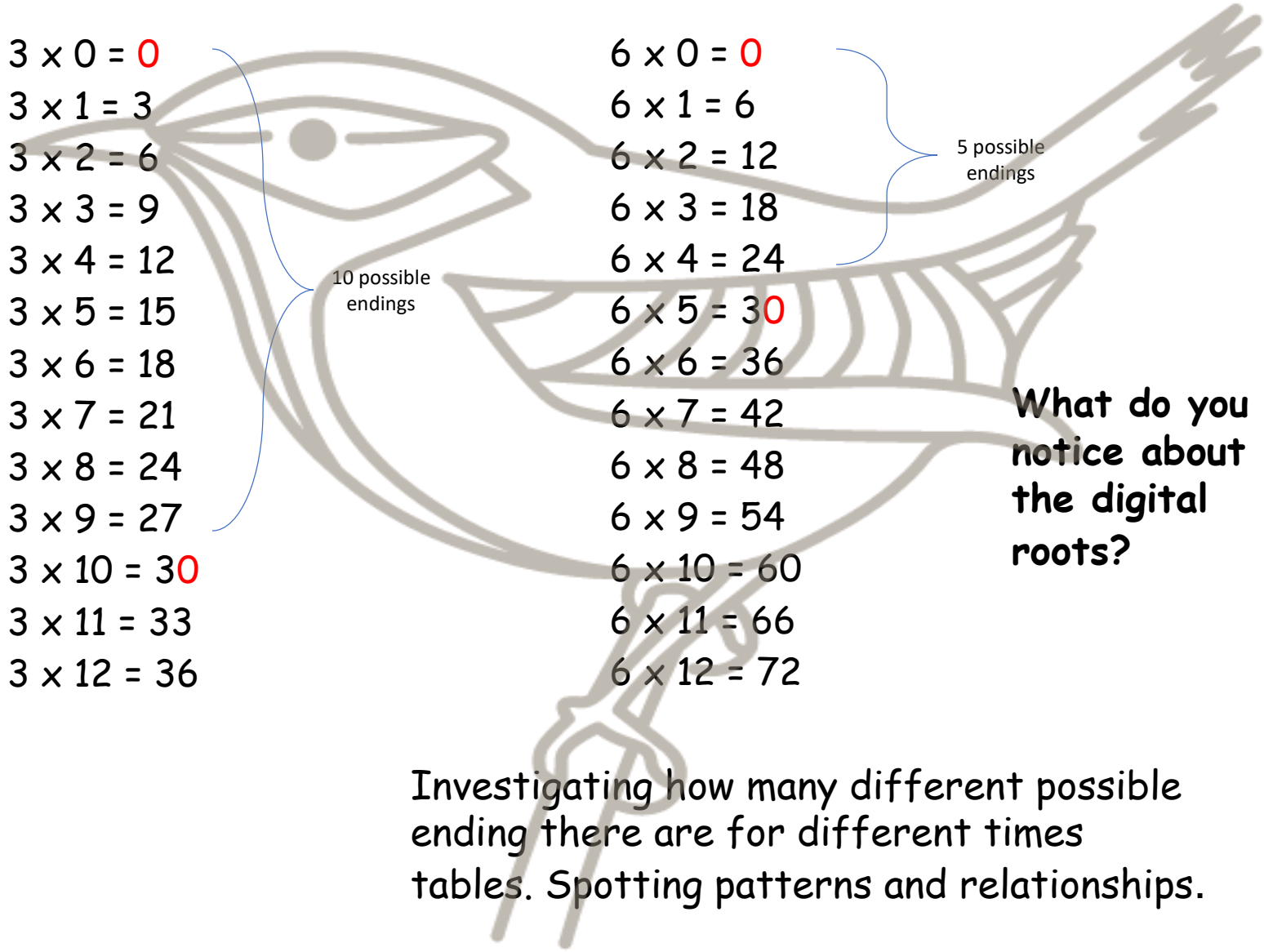
Ensure children engage with 'rich' tasks/investigations linked to times tables which encourage deeper learning, greater levels of reasoning, links to be made and patterns to be discovered.



nrich
Specialists in rich mathematics



e.g. - exploring last digit in multiples



3 x 0 = 0
3 x 1 = 3
3 x 2 = 6
3 x 3 = 9
3 x 4 = 12
3 x 5 = 15
3 x 6 = 18
3 x 7 = 21
3 x 8 = 24
3 x 9 = 27
3 x 10 = 30
3 x 11 = 33
3 x 12 = 36

10 possible endings

6 x 0 = 0
6 x 1 = 6
6 x 2 = 12
6 x 3 = 18
6 x 4 = 24
6 x 5 = 30
6 x 6 = 36
6 x 7 = 42
6 x 8 = 48
6 x 9 = 54
6 x 10 = 60
6 x 11 = 66
6 x 12 = 72

5 possible endings

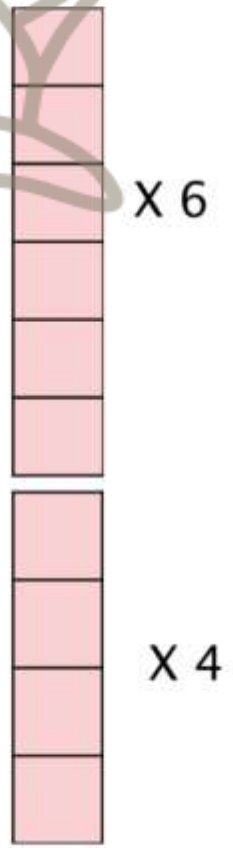
What do you notice about the digital roots?

Investigating how many different possible ending there are for different times tables. Spotting patterns and relationships.

e.g - exploring last digits in multiples

X 1	0,1,2,3,4,5,6,7,8,9,0
X 9	0,9,8,7,6,5,4,3,2,1,9
X 2	0,2,4,6,8,0
X 8	0,8,6,4,2,0
X 3	0,3,6,9,2,5,8,1,4,7,0
X 7	0,7,4,1,8,5,2,9,6,3,0
X 4	
X 6	

Pairs of times tables.
What do you notice?
What relationships can you find?



Intelligent Practice

2 × 3 =	6 × 7 =	9 × 8 =
2 × 30 =	6 × 70 =	9 × 80 =
2 × 300 =	6 × 700 =	9 × 800 =
20 × 3 =	60 × 7 =	90 × 8 =
200 × 3 =	600 × 7 =	900 × 8 =

What's stayed the same?

What's different?

$3 \times \square + 2 = 20$

$3 \times \square + 2 = 23$

$3 \times \square + 2 = 26$

$3 \times \square + 2 = 29$

$3 \times \square + 2 = 35$

$4 \times 5 = 10 \square 10$

$6 \square 5 = 15 + 15$

$6 \square 5 = 20 \square 10$

$8 \square 5 = 20 \square 20$

$8 \square 5 = 60 \square 20$

The relationship between 5 & 10

$1 \times 10 = 2 \times 5$

$2 \times 10 = 4 \times 5$

$3 \times 10 = 6 \times 5$

$4 \times 10 = 8 \times 5$

$5 \times 10 = 10 \times 5$

$6 \times 10 = 12 \times 5$

Half 10 is 5

Other examples of ways to deepen knowledge and understanding

Always, sometimes, never

- Multiples of 3 are all odd
- If the digits of a number add up to 9 the number is a multiple of 9
- Multiples of 7 are odd

Models and stories

Here is an expression involving 12 and 3:

Think of
a. some ways of saying "12 × 3"
b. some ways of calculating 12 × 3
c. some diagrams that fit the expression
d. some stories that fit the expression.

12×3

"What's the same, what's different …
between the three times table and the six times table?"

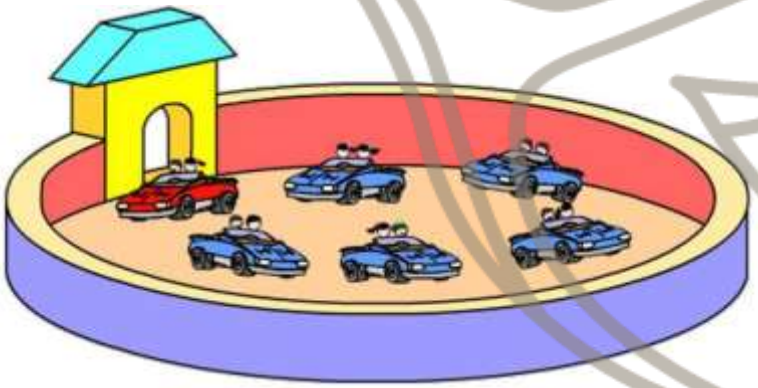
True or False

Children are given a series of equations are asked whether they are true or false:

$4 \times 6 = 23$ $4 \times 6 = 6 \times 4$ $12 \div 2 = 24 \div 4$ $12 \times 2 = 24 \times 4$

Step 6 – Consistency of how times tables are represented across the school. Language used is consistent.

Teachers should ensure they are clear about use of language 'multiplier' and 'multiplicand'. They should be confident to identify each within a multiplication problem and should encourage children to be able to identify each one within problems too.



It is fine to use the **multiplier** first and then the **multiplicand** (as long as teacher is clear and we are all doing the same).

e.g. 6 lots of 2 (things)

Addition number sentence: 2+2+2+2+2+2=12

Mulplication number sentence: 2 x 6 = 12 (people)

How many cars? 6 (multiplier)

How many people in each car? 2 (multiplicand)

How many people altogether? 12 (product)

Step 7 – Timetabled opportunities to practise times tables facts each week.

3 x 10 minute slots each week – evident in teacher's planning.

Use main lesson time to explore multiplicative reasoning.

The Pendulum

Split class into two teams. Must call out next multiple in times tables.

Forwards and backwards.

Start at different points

Quiet and loud (6X can be heard in X3)

Can apply to other areas of curriculum e.g. counting in decimals, fractions, percentages.

Beach ball

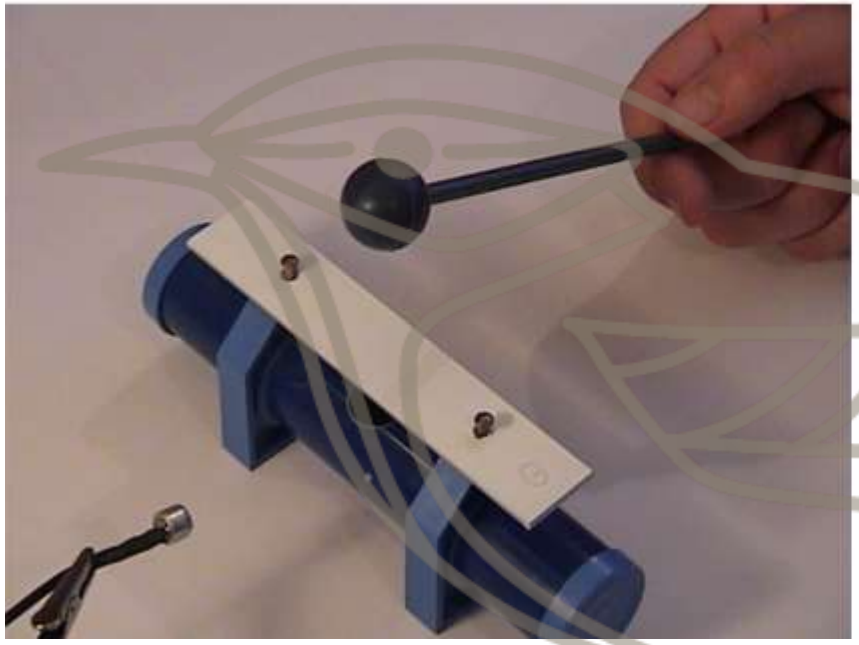
Throw round classroom. Person receiving must say next multiple in times tables.

Or...

Pass around room. Count silently in head. Teacher says 'back to me'. Ball returned to teacher. When teacher receives, children call out loud the next multiple.

Or...

Teacher calls out question e.g. 3 x 7 Throws to person. Before person catches ball, ret of class must call out the answer.

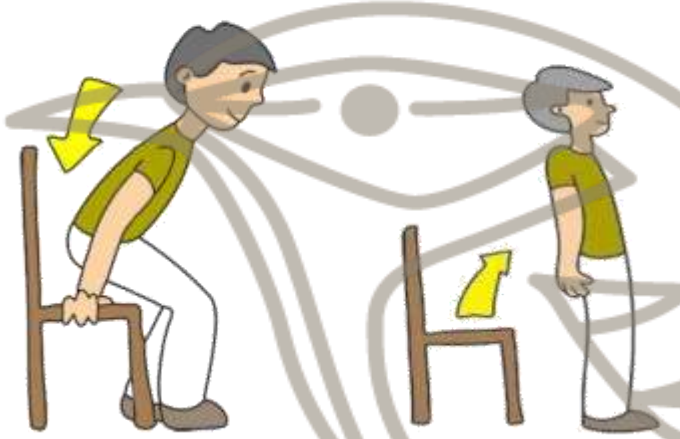


'The Gong'

Count silently in multiples of TT.

When I raise stick, call out number I have stopped at.

STAND UP SIT DOWN Multiplication



- Sit in pairs.
- Stand when pointed to and say next multiple in times table (e.g. 8X table)
- Repeat but this time have to remember the order they stood up in in the last round.
- Stand up if your number was 8 more than 24
- Stand up if your number was even. Why is that?
- Stand up if yours was a square number.
- Stand up if yours was 16 less than 32

(could hold numbers up on white boards)

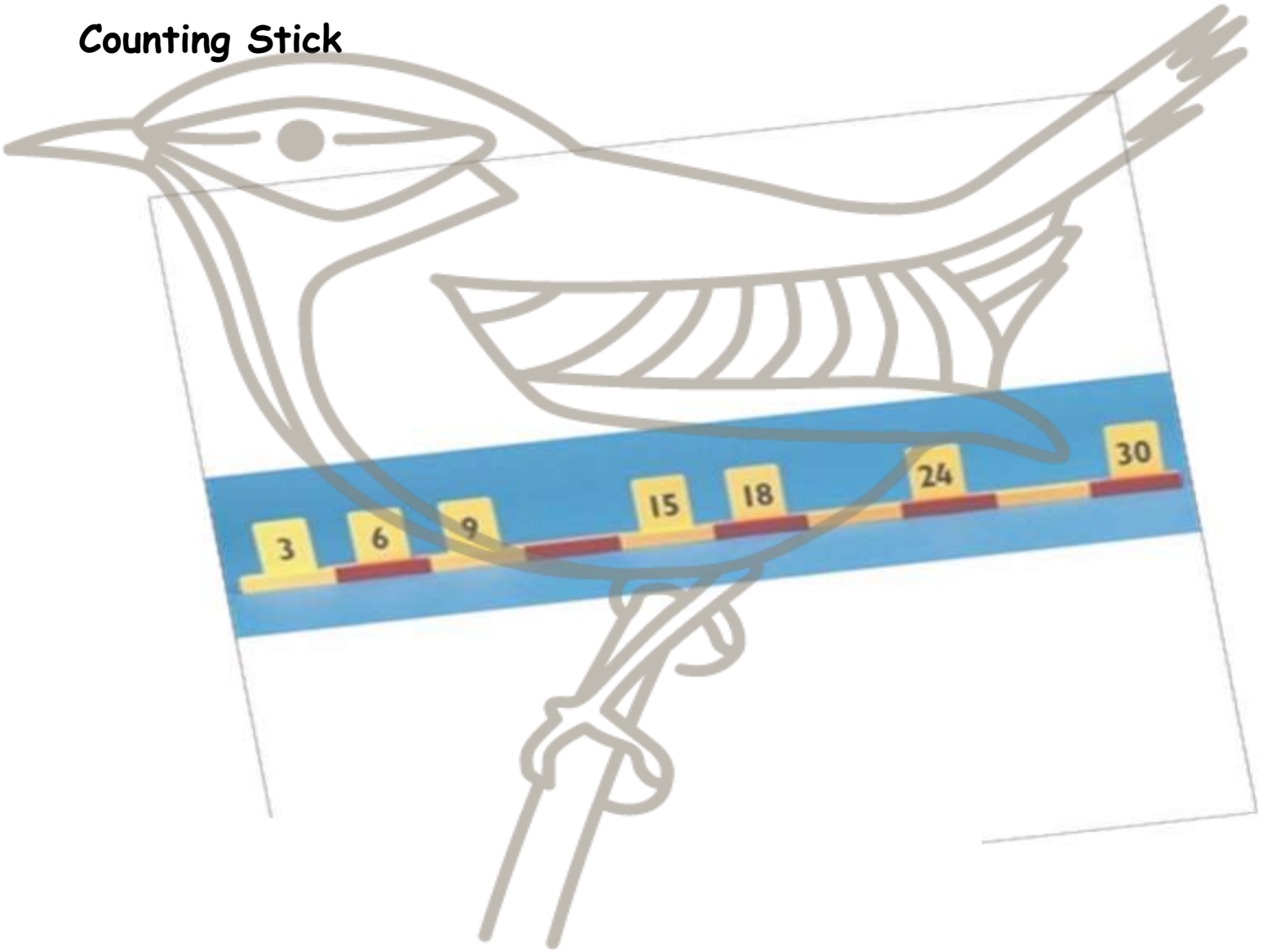
Target boards

10	8	5	18	4
9	20	13	3	6
16	12	15	7	19
1	2	17	11	14

e.g

- Tell me an odd number. And another. And another. How do you know?
- Which numbers are factors of 20? How do you know?
- Is 19 a multiple of 3? Convince me.
- How many prime numbers can you find?
- Can you find three numbers than you can link to make a multiplication/division sentence?

Counting Stick



Suggested script/structure for using the counting stick

Learning the 7 times table (adapt for times table being learnt)

Step 1: What number do we always start with?
Step 2: What times table are we learning?

(repeat steps 1&2)

Step 3: Can you multiply it by 10?

(repeat steps 1&2)

Step 4: Can you double it?
Step 5: Can you double that?

(repeat steps 1-5 in order)

Step 6: I have a very special number to tell you and it is called the key. Our key in this times table is 21. What is our key?
Step 7: Can you double the key?
Step 8: This is really hard now, can you triple the key?

(Repeat steps 1-8 in order)

Step 9: Who remembers our key? (*children answer*) Double it. Now add seven

(repeat steps 1-9)

Step 10: Everybody touch your nose. That's 35. Touch your nose.
Step 11: Now everybody needs to help me. There is one number I always forget. It's 56. What
number do I always forget?

(Repeat steps 1-11)

Begin to remove the cards as children become more confident with remembering

https://www.youtube.com/watch?v=yXdHGBfoqfw

Monitoring information:
The policy will be promoted and implemented throughout the school by all staff. The school will review this policy through the Curriculum and Standards committee annually and assess its implementation and effectiveness.

Links with other policies:
Other important documentation to be read in conjunction with the Multiplication Policy:

- Wren's Nest Mathematics Policy
- White Rose Medium Term Planning
- Wren's Nest Visual Calculation Policy
- Wren's Nest Visual Fraction Policy
- White Rose Manipulatives Policy
- The NCETM Cross Curricular Links
- Wren's Nest Marking Policy

Date of Review: September 2021 **Policy to be reviewed: September 2022**